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| 10/786,349 | 02/25/2004 | Ralf Buergel | 2001P05854US02 | 4552 |

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| EXAMINER |
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MILLER, MICHAEL G

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| ART UNIT | PAPER NUMBER |
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1792

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01/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/786,349 | Applicant(s) BUERGEL ET AL. | |
| | Examiner MICHAEL G. MILLER | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

- 1) Examiner notes and accepts the amendment filed 01 OCT 2008. Claims 13, 16 and 27 are amended; Claim 34 is new.

Response to Arguments

- 2) Applicant's arguments filed 01 OCT 2008 have been fully considered but they are not persuasive.
- 3) Applicant's arguments all revolve around the assertion that Czech teaches away from the claimed invention because it cautions staying well below the solution temperature of the alloy. As Examiner has stated in prior Office Actions, Applicant has presented evidence that there are multiple solution temperatures in an alloy by the presence of claims calling for the solution temperature to be at least the solution temperature of a given phase of the alloy and not the entirety of the alloy. In Applicant's case, this is the LOWEST solution temperature of any phase present. Czech's teaching encompasses the entire alloy ("However, the temperature should always be kept well below the solution temperature of the base material alloy.", emphasis added by Examiner), which includes the highest solution temperature of a given phase in the alloy, the lowest solution temperature of a given phase in the alloy, and all points therebetween. Therefore, Czech teaches a solution temperature within the scope of Applicant's claims and Examiner maintains all previous grounds of rejection made in the previous Office Action based on this argument.

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- 4) Examiner notes that the amendments to Claims 13 and 16 are an addition of material claimed in at least Claim 30, which is rejected under the same teaching (Czech) as Claims 13 and 16. Examiner will incorporate this material into the rejections below.
- 5) Examiner removes the objection to Claim 27, as it is now no longer multiply dependent.

Claim Rejections - 35 USC § 102

- 6) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 7) Claims 13, 15-16, 18, 21, 24, 30-32 and 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Czech et al (European Patent 0525545, hereinafter '545).
- 8) With regard to Claim 13, '545 teaches a method for refurbishing a gas turbine blade made from a textured superalloy body coated with a protective coating (Page 2 Lines 22-24 and Lines 35-37), the method comprising the steps of:
 - a) Coating a surface of said body with a high temperature stable surface coating, thereby covering said protective coating (Page 3 Lines 52-55 and Page 5 Lines 17-21);

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- b) Restoring the microstructure of the superalloy body by performing a solution heat treatment on the body, thereby maintaining said thermally stable surface coating (Page 5, Lines 17-21, re-diffusion treatment, and 37-40, the heat treatment allows for removal of the non-single-crystal defects which restores the microstructure of the body after processing);
 - c) Removing jointly said surface coating and said protective coating (Page 7 Lines 37-54; the remnants of the protective coating, being inside the aluminide layer, will be removed along with the aluminide layer); and
 - d) Providing a second protective coating on said body (Page 7 Lines 55-57).
- 9) With regard to Claim 15, '545 teaches the method according to Claim 13, wherein:
- a) Said solution heat treatment is performed with a temperature above 1100°C (Page 5 Lines 17-21).
- 10) Claim 18 is rejected on the same basis as Claim 15.
- 11) With regard to Claim 16, '545 teaches a method for refurbishing a gas turbine blade made from a textured superalloy body coated with a protective coating, the method comprising the steps of:
- a) Removing the protective coating (Page 3 Lines 29-34);
 - b) Coating a surface of said body with a high temperature stable surface coating (Page 3 Lines 52-55 and Page 5 Lines 17-21);
 - c) Restoring the microstructure of the superalloy body by performing a solution heat treatment on the body, thereby maintaining said thermally stable surface coating (Page 5, Lines 17-21, re-diffusion treatment, and 37-40, the heat treatment

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allows for removal of the non-single-crystal defects which restores the microstructure of the body after processing);

d) Removing the surface coating (Page 7 Lines 37-54); and

e) Providing a second protective coating on said body (Page 7 Lines 55-57).

12)With regard to Claim 21, which multiply and distinctly includes the limitations of Claims 13 and 16 above, '545 teaches the method according to Claim 13/16, wherein:

a) Said surface is applied with an appropriate surface coating (Page 3 Lines 10-13; aluminide is taught to be an appropriate refurbishing coating).

13)With regard to Claim 24, which multiple and distinctly includes the limitations of Claims 13 and 16 above, '545 teaches the appropriate method according to Claim 13/16, wherein:

a) A metallic surface layer, in particular of nickel or cobalt is used (Page 3 Lines 10-13; aluminide, while not required to be composed of nickel or cobalt, will form a metallic surface layer).

14)With regard to Claim 30, '545 teaches a method for recovering texture of a textured article which is made from a superalloy, comprising the steps of:

a) Creating on the surface of the article a high temperature stable surface coating (Page 3 Lines 52-55 and Page 5 Lines 17-21);

b) Performing a solution heat treatment on said article wherein a γ -phase and a γ' -phase are present in said superalloy and the temperature of said solution heat treatment is at least the solution temperature of the γ' -phase, thereby maintaining

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said thermally stable surface coating (Page 5 Lines 17-21; the phases are present by virtue of the sulphur inclusions which form along grain boundaries which form along phase boundaries; the method of diffusion requires operation at the solution temperature of the γ' -phase for anything to occur);

- c) Restoring the microstructure of the textured article (Page 5 Lines 37-40, wherein the single-crystal structure is restored by removing the outer non-single-crystal structure);
- d) And suppressing grain recrystallization by providing bulk conditions which assure a higher temperature threshold for grain recrystallization (inherent by the properties of solid-air and solid-solid heat interfaces).

15)With regard to Claim 31, which includes all the limitations of Claim 30 above, '545 teaches the method of Claim 30, wherein:

- a) Said article is a gas turbine component (Page 2 Lines 1-3).

16)With regard to Claim 32, which includes all the limitations of Claim 31 above, '545 teaches the method of Claim 30, wherein:

- a) Said gas turbine component is a blade or vane (Page 2 Lines 1-3).

17)With regards to Claim 34, which includes all the limitations of Claim 24 above, '545 teaches the method of Claim 24, wherein:

- a) The surface layer is removed by means of an acid treatment (Page 3 Lines 39-42, further described in page 7 Lines 39-44).

Claim Rejections - 35 USC § 103

18)The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19)The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- i) Determining the scope and contents of the prior art.
- ii) Ascertaining the differences between the prior art and the Claims at issue.
- iii) Resolving the level of ordinary skill in the pertinent art.
- iv) Considering objective evidence present in the application indicating obviousness or nonobviousness.

20)This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21)Claims 14, 17, 19-20 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over '545 as applied to Claim 13/16 above, and further in view of '283.

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22)With regard to Claim 14, which includes all the limitations of Claim 13 above, '545

teaches the method according to Claim 13, except for the following limitation:

- a) A γ -phase and a γ' -phase are present in said superalloy and the temperature of said solution heat treatment is at least the solution temperature of the γ' -phase.
- b) '283 discusses superalloys suitable for use in gas turbine components.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have applied the method of '545 to gas turbine components formed as discussed in '283 since '545 wants to refurbish gas turbine parts and '283 teaches methods and materials that are suitable for that use.

- c) '283 further teaches that superalloy solution heat treatments, when applied to either single crystal or directionally solidified alloy articles, are performed at the solution temperature of the superalloy, and further that this solution temperature is below the solidus temperature of the superalloy. Further, the diffusion temperature must be at least the γ' -temperature, otherwise diffusion would not be possible.

23)Claim 17 is rejected on the same basis as Claim 14.

24)With regard to Claims 19-20, which multiply and distinctly includes the limitations of Claims 13 and 16 above, '545 teaches the method according to Claim 13/16 except for the following limitation

- a) The textured article is a single crystal article.

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- b) '283 teaches that it is known to form gas turbine components from single crystal structures (Column 1 Lines 15-33; the reason for the oxide scale film in this art is that the gas turbine components, even after being made from single crystal advanced superalloys, are still inadequate for the task).
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have applied the method of '545 to a single crystal article as described in '283 because '545 wants to treat textured gas turbine components and '283 teaches that single crystal textured gas turbine components are known in the art.

25) Claim 20 is rejected on the same basis as Claim 19, as '283 talks about both single crystal and directionally solidified gas turbine components.

26) Claims 28 and 29 are rejected on the same basis as Claim 14, as the further limitation wherein the protective coating will suppress the grain recrystallization properties is inherent to this process.

27) Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over '545 as applied to Claim 13/16 above, and further in view of Saltzman et al (U.S. Patent 4,878,953, hereinafter '953).

28) With specific regard to Claim 22, which multiply and distinctly includes all the limitations of Claim 13 and 16 above, '545 teaches the method according to Claim 13/16, except for the following limitation:

- a) The surface layer is applied to a region which has been newly built up, in particular has been produced by build-up welding.

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b) '953 teaches a method of building up an area of a gas turbine using welding techniques to repair certain defects (Column 3 Line 61 – Column 7 Line 3). '953 also teaches that its method of refurbishing is particularly useful in treating nickel-base superalloys with a gamma prime phase – a same class of material as taught in '545.

c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have combined the methods of '545 and '953 because '545 strives to remove inclusions and '953 is capable of repairing defects including inclusions (Column 3 Lines 62 – 66 specifically).

29) Claim 23 is rejected on the same grounds as Claim 22, as the citation in Claim 22 also covers repairing cracks (Column 3 Lines 62 – 66).

30) Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over '545 as applied to Claim 13/16 above, and further in view of Olson et al (U.S. Patent 4,933,239, hereinafter '239).

31) With specific regard to Claim 25, which multiply and distinctly includes all the limitations of Claim 13/24 and 16/24 above, '545 teaches the method according to Claim 24, except for the following limitation:

a) The metallic layer is applied by electroplating.

b) '239 teaches that it is known to deposit aluminides via electroplating (Column 7 Lines 1-22).

c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the method of '545 by

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electroplating the aluminide compound onto the substrate as taught in '239

because '545 wants an aluminide coating and '239 teaches that electroplating is a known method to obtain such.

32) Claims 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over '545 as applied to Claim 13/16 above, and further in view of Kashirin et al (U.S. PGPub 2003/0091755, hereinafter '755).

33) With specific regard to Claim 26, which multiple and distinctly includes all the limitations of Claim 13/24 and 16/24 above, '545 teaches the method according to Claim 24, except for the following limitation:

- a) The surface layer is applied by cold gas spraying.
- b) '755 teaches application of metallic surface layers to substrates (PG 0011 – 0031, TABLE which shows several compositions of greater than 2% Al).
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have applied the aluminide layer called for in '545 by the cold gas spraying method of '755, since '545 wants a method of aluminide deposition and '755 teaches a known method of doing such.

34) With regards to Claim 27, which includes all the limitations of Claim 26 above,

'545/'755 teaches the method of Claim 26, wherein:

- a) The surface layer is removed by means of an acid treatment ('545 Page 3 Lines 39-42, further described in page 7 Lines 39-44).

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35) Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over '545 as applied to Claim 30 above, and further in view of Haydon et al (European Patent 0186797, hereinafter '797).

36) With regard to Claim 33, which includes all the limitations of Claim 30 above, '545 teaches the method according to Claim 30, except for the following limitation:

- a) Said superalloy is cobalt-based with precipitations or carbides that provide a strengthening mechanism similar to a γ -phase in Nickel based alloys.
- b) '797 teaches a cobalt-based alloy with carbon and monocarbide-forming material inclusions added for the purpose of providing enhanced strengthening mechanisms to the alloy (Page 2 Line 22 – Page 3 Line 36).
- c) Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have performed the method of '545 on gas turbines formed by the material of '797 because '545 wants to refurbish gas turbine components and '797 teaches a material that is known for use in gas turbine components.

Conclusion

37) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL G. MILLER whose telephone number is (571)270-1861. The examiner can normally be reached on M-F 7-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael G. Miller/
Examiner, Art Unit 1792

/Timothy H Meeks/
Supervisory Patent Examiner, Art Unit 1792